



# AFCTN Test Report

## 94-049

AFCTB-ID  
93-100



## Technical Raster Transfer

using:

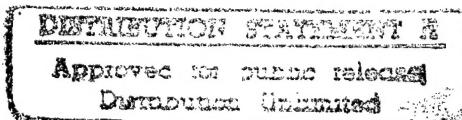
ASC/AMIS' Data



MIL-R-28002A (Raster)



Quick Short Test Report



21 October 1993

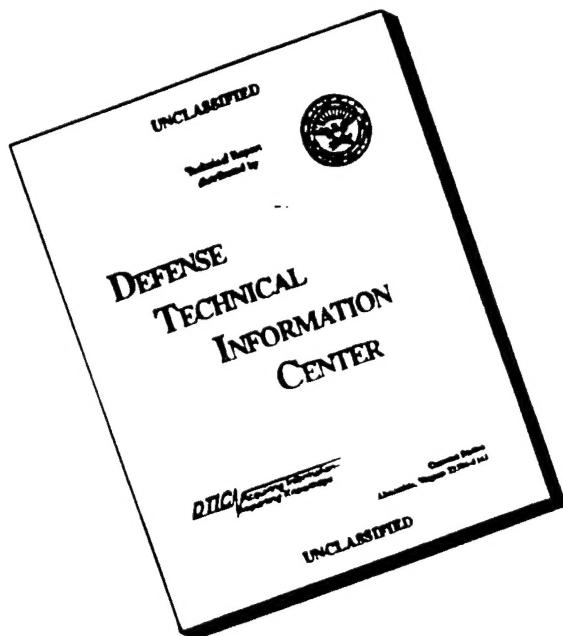


Prepared for  
Electronic Systems Center  
Det 2 HQ ESC/AV-2  
4027 Colonel Glenn Hwy, Suite 300  
Dayton, Ohio 45431-1672

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**Technical Raster Transfer  
Using:  
ASC/AMIS' Data**

**MIL-R-28002A (Raster)**

**Quick Short Test Report**

**21 October 1993**

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**Prepared By**

Air Force CALS Test Bed  
Wright-Patterson AFB, OH 45433

**AFCTB Contact**

Gary Lammers  
(513) 427-2295

**AFCTN Contact**

Mel Lammers  
(513) 427-2295

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## 1. Introduction

### 1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

## **1.2 Purpose**

The purpose of the informal test, reported in this QSTR, was to analyze ASC/AMIS's interpretation and use of the CALS standards in transferring technical Raster data. ASC/AMIS used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

## 2. Test Parameters

**Test Plan:** AFCTB 93-100

**Date of Evaluation:** 21 October 1993

**Evaluator:**  
George Elwood  
Air Force CALS Test Bed  
HQ ESC/AV-2P  
4027 Colonel Glenn Hwy  
Suite 300  
Dayton OH 45431-1672

**Data Originator:**  
HQ ASC/AMIS  
Diane Sondergelt  
Wright-Patterson AFB, OH 45433

**Data Description:**  
Technical Manual Test  
3 Document Declaration files  
3 Raster file

**Data Source System:**  
1840  
**HARDWARE**  
Unknown  
**SOFTWARE**  
Intergraph XXXX

Raster  
**HARDWARE**  
Unknown  
**SOFTWARE**  
Unknown

**Evaluation Tools Used:**

MIL-STD-1840A (TAPE)  
SUN 3/280  
AFCTN Tapetool v1.2.10 UNIX  
PC 486/50  
AFCTN Tapetool v1.2.10 DOS

**MIL-R-28002 (Raster)**  
SUN SparcStation 2  
Carberry CADLeaf Plus v3.1  
AFCTN validg4  
AFCTN calstb.475  
AFCTN xrastb.sun4  
IGES Data Analysis (IDA) IGESView v3.0  
Island Graphics IslandPaint v3.0  
SGI Indigo2  
AFCTN xrastb.sgi  
PC 486/50  
AFCTN validg4  
IDA IGESView Windows  
Inset Systems HiJaak v2.1  
Inset Systems HiJaak Window v1.0  
Expert Graphics RxHighlight v1.0

**Standards  
Tested:**  
MIL-STD-1840A  
MIL-R-28002A

### **3. 1840A Analysis**

#### **3.1 External Packaging**

The tape was hand delivered to the Air Force CALS Test Bed (AFCTB) not enclosed in a box in accordance with ASTM D 3951.

Inspection of the tape reel showed the label indicating the recording density, as required by MIL-STD-1840A, para. 5.3.1.

#### **3.2 Transmission Envelope**

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

##### **3.2.1 Tape Formats**

The tape was run through the AFCTN Tapetool v1.2.10 utility. No errors and four notes were encountered while evaluating the contents of the tape labels. All of the errors are shown in Appendix A, Section Two, Tape Import Log.

A note was reported on the tape label version. MIL-STD-1840A permits the use of both version three and four. The use of the most current standard should be used and noted.

All three Document Declaration files were reported as having a short block. The end of the block was not padded out. This may cause some tape systems to not read the data. No errors were noted in any of the files.

\*\*\* NOTE - Last block was incomplete. Short blocks are prone to be interpreted as noise by some tape drives.  
Tape Label => 2048, Actual => 392, Block Number => 1

An attempt to read using another utility available within the AFCTB was made. Because of the error in the "chlvl" header, this tape utility quit processing the tape.

The physical structure of the tape meets the requirements defined in MIL-STD-1840A.

### 3.2.2 Declaration and Header Fields

Twenty-five errors and 23 notes were reported in the Document Declaration file and data file headers.

In Document Declaration File D001, an invalid change level was flagged. The MIL-STD-1840A record header was misspelled only in this Declaration file.

```
chlvl: ORIGINAL
*** ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid Document Declaration header
      field name. Expected => chlvl:
*** NOTE - The value in the header field may not be evaluated.
*** NOTE - Correction made in new Document Declaration Header File.
```

The date of transmission in all three Declaration files was wrong. The value "m19" was inserted in all cases. This should have reflected the actual date the tape was made.

```
dtetrn: m19
*** ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid date format encountered.
*** NOTE (MIL-STD-1840A; 5.1.1.2) - Date Format shall be a four digit year
      followed by a two digit month followed by a two digit day.
```

All three Raster header records contained the same errors. The errors relate to no zero filling values for records "rorient", "rpelcnt", and "rdenssty" as defined in MIL-STD-1840A. Shown below are the errors reported for file D001R001.

```
rorient: 0,270
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path direction was not a
      zero-filled three character number.
```

---

```
*** NOTE - The header record will be given the value 000,270.  
*** NOTE - Correction made in new Raster Header File.  
rpelcnt: 4416, 6916  
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.  
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path pels was not a  
zero-filled six character number.  
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for progression lines was not a  
zero-filled six character number.  
*** NOTE - The header record will be given the value 004416,006916.  
*** NOTE - Correction made in new Raster Header File.  
rdensity: 200  
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.  
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for Raster density was not a  
zero-filled four character number.  
*** NOTE - The header record will be given the value 0200.  
*** NOTE - Correction made in new Raster Header File.
```

This portion of the tape did not meet the requirements defined in MIL-STD-1840A.

#### **4. IGES Analysis**

The tape contained no Initial Graphics Exchange Specification (IGES) files.

#### **5. SGML Analysis**

The tape contained no Standard Generalized Markup Language (SGML) files.

#### **6. Raster Analysis**

The tape contained three Raster files. All files were evaluated using the AFCTN *validg4* utility. This program reported that all file meet the CALS MIL-R-28002 specification.

The files were read into the AFCTN *xrastb.sun4* viewing utility. No problems were noted.

The AFCTB has several tools for viewing Raster files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The files were converted using another utility available within the AFCTB without a reported error. The resulting files were read into Island Graphics' *IslandPaint* and displayed. Because the files were very large, they could not be printed using this software.

The Raster files were read into Carberry's *CADLeaf* software without a reported error. The images were displayed. Because of the large file size, they could not be printed.

The files were read into IDA's *IGESView* and *IGESView for Windows* without a reported error. Both the UNIX and PC versions permitted the printing of the files.

The files were read into Inset Systems' *HiJaak for Windows* without a reported error. The files could be printed without a reported error.

The Raster files were converted using Rosetta Technologies' *Prepare* without a reported error. The resulting files were read into Rosetta Technologies' *Preview*, displayed and printed.

The Raster files were read into Expert Graphics *RxHighlight V1.0* and displayed without a reported error.

The Raster files meet the CALS MIL-R-28002A specification.

## 7. CGM Analysis

The tape contained no Computer Graphics Metafiles (CGM) files.

## **8. Conclusions and Recommendations**

The physical structure of the MIL-STD-1840A tape from ASC/AMIS was correct. The structure and the data included in the Declaration files and data file headers had many errors. This portion of the tape does not meet the requirements defined in MIL-STD-1840A.

The Raster files meet the CALS MIL-R-28002A specification.

Because of the errors in the CALS headers and Declaration files, the tape does not meet the CALS MIL-STD-1840A requirements.

## 9. Appendix A - Tapetool Report Logs

### 9.1 Tape Catalog

CALS Test Network Catalog Evaluation - Version 1.2; Release 10 (C)

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information  
ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes  
for Information Interchange  
ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Thu Oct 21 08:23:06 1993

MIL-STD-1840A File Catalog

File Set Directory: /cals/u1210/Set029

Page: 1

File Name	File Type	Record Format/ Length	Block Length/ Length/Total	Selected/ Extracted
D001	Document Declaration	D/00260	02048/000001	Extracted
D002	Document Declaration	D/00260	02048/000001	Extracted
D003	Document Declaration	D/00260	02048/000001	Extracted
D001R001	Raster	F/00128	02048/000050	Extracted
D002R001	Raster	F/00128	02048/000024	Extracted
D003R001	Raster	F/00128	02048/000046	Extracted

Catalog Process terminated normally.

## 9.2 Tape Evaluation Log

CALS Test Network Tape Evaluation - Version 1.2; Release 10 (C)  
Standards referenced:

**ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes  
for Information Interchange**  
**ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII**

Thu Oct 21 08:22:58 1993

```
ANSI Tape Import Log  
Allocating tape drive /dev/rmt0...  
/dev/rmt0 allocated.
```

**VOL1TAPE01** **SONDERGD**

Label Identifier: VOL1  
Volume Identifier: TAPE01  
Volume Accessibility:  
Owner Identifier: SONDERGD  
Label Standard Version: 3

\*\*\* NOTE (ANSI X3.27; 8.3.1.8) - The Label Standard Version  
should be 4 to represent the current level of ANSI X3.27.

HDR1D001 TAPE0100010001000100 93291 93291 000000INIXTAPEV2 0

Label Identifier: HDR1  
File Identifier: D001  
File Set Identifier: TAPE01  
File Section Number: 0001  
File Sequence Number: 0001  
Generation Number: 0001  
Generation Version Number: 00  
Creation Date: 93291  
Expiration Date: 93291  
File Accessibility:  
Block Count: 000000  
Implementation Identifier: UNIXTAPEV2.0

HDR2D020480026000SONDERGD//USR/BIN B 00

Label Identifier: HDR2  
Recording Format: D  
Block Length: 02048  
Record Length: 00260  
Offset Length: 00

\*\*\*\*\* Tape Mark \*\*\*\*\*

Actual Block Size Found = 392 Bytes.

\*\*\* NOTE - Last block was incomplete. Short blocks are  
pronounced to be interpreted as noise by some tape drives.  
Tape Label => 2048, Actual => 392, Block Number => 1

Number of data blocks read = 1.

\*\*\*\*\* Tape Mark \*\*\*\*\*

EOF1D001 TAPE0100010001000100 93291 93291 000001UNIXTAPEV2.0

Label Identifier: EOF1  
File Identifier: D001  
File Set Identifier: TAPE01  
File Section Number: 0001  
File Sequence Number: 0001  
Generation Number: 0001  
Generation Version Number: 00  
Creation Date: 93291  
Expiration Date: 93291  
File Accessibility:  
Block Count: 000001  
Implementation Identifier: UNIXTAPEV2.0

EOF2D020480026000SONDERGD//USR/BIN B 00

Label Identifier: EOF2  
Recording Format: D  
Block Length: 02048  
Record Length: 00260  
Offset Length: 00

\*\*\*\*\* Tape Mark \*\*\*\*\*

<<<< PART OF LOG FILE REMOVED HERE >>>>

\*\*\*\*\* Tape Mark \*\*\*\*\*

##### End of Volume TAPE01 #####

##### End Of Tape File Set #####

Deallocating /dev/rmt0...

Tape Import Process terminated with 0 error(s), 0 warning(s),  
and 4 note(s).

## 9.3 Tape File Set Validation Log

CALS Test Network File Set Evaluation - Version 1.2; Release 10 (C)

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Thu Oct 21 08:23:06 1993

MIL-STD-1840A File Set Evaluation Log

File Set: Set029

Found file: D001

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

srcsys: Intergraph at 4950TW, WPAFB OH

srcdocid: X92D127595, Sht 1

srcrelid: NONE

chglvl: ORIGINAL

\*\*\* ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid Document Declaration header field name. Expected => chglvl:

\*\*\* NOTE - The value in the header field may not be evaluated.

\*\*\* NOTE - Correction made in new Document Declaration Header File.

dteisu: 19930802

dstsys: EDCARS, OO\_PKDE, HAFB UT

dstdocid: X92D127595, Sht 1

dstrelid: NONE

dtetrn: m19

\*\*\* ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid date format encountered.

\*\*\* NOTE (MIL-STD-1840A; 5.1.1.2) - Date Format shall be a four digit year followed by a two digit month followed by a two digit day.

dlvacc: NONE

filcnt: r1

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: WIRING DIAGRAM

docttl: WIRING DIAGRAM, TFE 28 VDC POWER AND CONTROL

2 error(s), 0 warning(s), and 3 note(s) were encountered in Document Declaration File D001.

Found file: D001R001

Extracting Raster Header Records...

Evaluating Raster Header Records...

```
srcdocid: X92D127595          07878          00010001UMEHU
001D
dstdocid: X92D127595
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: Unclass
rtype: 1
rorient: 0,270
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path direction was not a
zero-filled three character number.
*** NOTE - The header record will be given the value 000,270.
*** NOTE - Correction made in new Raster Header File.
rpelcnt: 4416, 6916
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path pels was not a
zero-filled six character number.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for progression lines was not a
zero-filled six character number.
*** NOTE - The header record will be given the value 004416,006916.
*** NOTE - Correction made in new Raster Header File.
rdensity: 200
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for Raster density was not a
zero-filled four character number.
*** NOTE - The header record will be given the value 0200.
*** NOTE - Correction made in new Raster Header File.
notes: Created through ODI Raster file driver
```

7 error(s), 0 warning(s), and 6 note(s) were encountered  
in Raster File D001R001.

Saving Raster Header File: D001R001\_HDR

Saving Raster Data File: D001R001\_GR4

Evaluating numbering scheme...

No errors were encountered during numbering scheme evaluation.  
Numbering scheme evaluation complete.

Checking file count...

No errors were encountered during file count verification.  
File Count verification complete.

A total of 9 error(s), 0 warning(s), and 9 note(s) were  
encountered in Document D001.

Found file: D002

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

```
srcsys: Intergraph at 4950TW. WPAFB OH
srcdocid: X92D127595, Sht 2
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930802
dstsys: EDCARS, OO-PKDE, HAFB UT
dstdocid: X92D127595, Sht 2
dstrelid: NONE
dtetrn: m19
*** ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid date format encountered.
*** NOTE (MIL-STD-1840A; 5.1.1.2) - Date Format shall be a four digit year
      followed by a two digit month followed by a two digit day.
dlvacc: NONE
filcnt: r1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: WIRING DIAGRAM
docttl: WIRING DIAGRAM, TFE-25 28VDC POWER AND CONTROL
```

1 error(s), 0 warning(s), and 1 note(s) were encountered  
in Document Declaration File D002.

Found file: D002R001
Extracting Raster Header Records...
Evaluating Raster Header Records...

```
srcdocid: X92D127595          07878          00010001UMEHU
002D
dstdocid: X92D127595
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: Unclass
rtype: 1
rorient: 0,270
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path direction was not a
      zero-filled three character number.
*** NOTE - The header record will be given the value 000,270.
*** NOTE - Correction made in new Raster Header File.
rpelcnt: 4416, 6916
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path pels was not a
      zero-filled six character number.
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for progression lines was not a
      zero-filled six character number.
```

\*\*\* NOTE - The header record will be given the value 004416,006916.  
\*\*\* NOTE - Correction made in new Raster Header File.  
rdensity: 200  
\*\*\* ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.  
\*\*\* ERROR (MIL-STD-1840A; 5.1.4.4) - Value for Raster density was not a  
zero-filled four character number.  
\*\*\* NOTE - The header record will be given the value 0200.  
\*\*\* NOTE - Correction made in new Raster Header File.  
notes: Created through ODI Raster file driver

7 error(s), 0 warning(s), and 6 note(s) were encountered  
in Raster File D002R001.

Saving Raster Header File: D002R001\_HDR

Saving Raster Data File: D002R001\_GR4

Evaluating numbering scheme...

No errors were encountered during numbering scheme evaluation.  
Numbering scheme evaluation complete.

Checking file count...

No errors were encountered during file count verification.  
File Count verification complete.

A total of 8 error(s), 0 warning(s), and 7 note(s) were  
encountered in Document D002.

Found file: D003

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

srcsys: Intergraph at 4950TW. WPAFB OH

srcdocid: X92D127597, Sht 1

srcrelid: NONE

chglvl: ORIGINAL

dteisu: 19930802

dstsys: EDCARS, OO-PKDE, HAFB UT

dstdocid: X92D127597. Sht 1

dstrelid: NONE

dtetrn: m19

\*\*\* ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid date format encountered.

\*\*\* NOTE (MIL-STD-1840A; 5.1.1.2) - Date Format shall be a four digit year  
followed by a two digit month followed by a two digit day.

dlvacc: NONE

filcnt: r1

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: WIRING DIAGRAM

docttl: WIRING DIAGRAM, TFE-25 115V 400HZ POWER DISTRIBUTION

1 error(s), 0 warning(s), and 1 note(s) were encountered  
in Document Declaration File D003.

Found file: D003R001  
Extracting Raster Header Records...  
Evaluating Raster Header Records...

srcdocid: X92D127597	07878	00010001UMEHU
001D		
dstdocid: X92D127597		
txtfilid: NONE		
figid: NONE		
srcgph: NONE		
doccls: Unclass		
rtype: 1		
rorient: 0,270		
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.		
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path direction was not a zero-filled three character number.		
*** NOTE - The header record will be given the value 000,270.		
*** NOTE - Correction made in new Raster Header File.		
rpelcnt: 4416, 6916		
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.		
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for pel path pels was not a zero-filled six character number.		
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for progression lines was not a zero-filled six character number.		
*** NOTE - The header record will be given the value 004416,006916.		
*** NOTE - Correction made in new Raster Header File.		
rdensty: 200		
*** ERROR (MIL-STD-1840A; 5.1.4) - Value contains leading spaces.		
*** ERROR (MIL-STD-1840A; 5.1.4.4) - Value for Raster density was not a zero-filled four character number.		
*** NOTE - The header record will be given the value 0200.		
*** NOTE - Correction made in new Raster Header File.		
notes: Created through ODI Raster file driver		

7 error(s), 0 warning(s), and 6 note(s) were encountered  
in Raster File D003R001.

Saving Raster Header File: D003R001\_HDR  
Saving Raster Data File: D003R001\_GR4

Evaluating numbering scheme...  
No errors were encountered during numbering scheme evaluation.  
Numbering scheme evaluation complete.

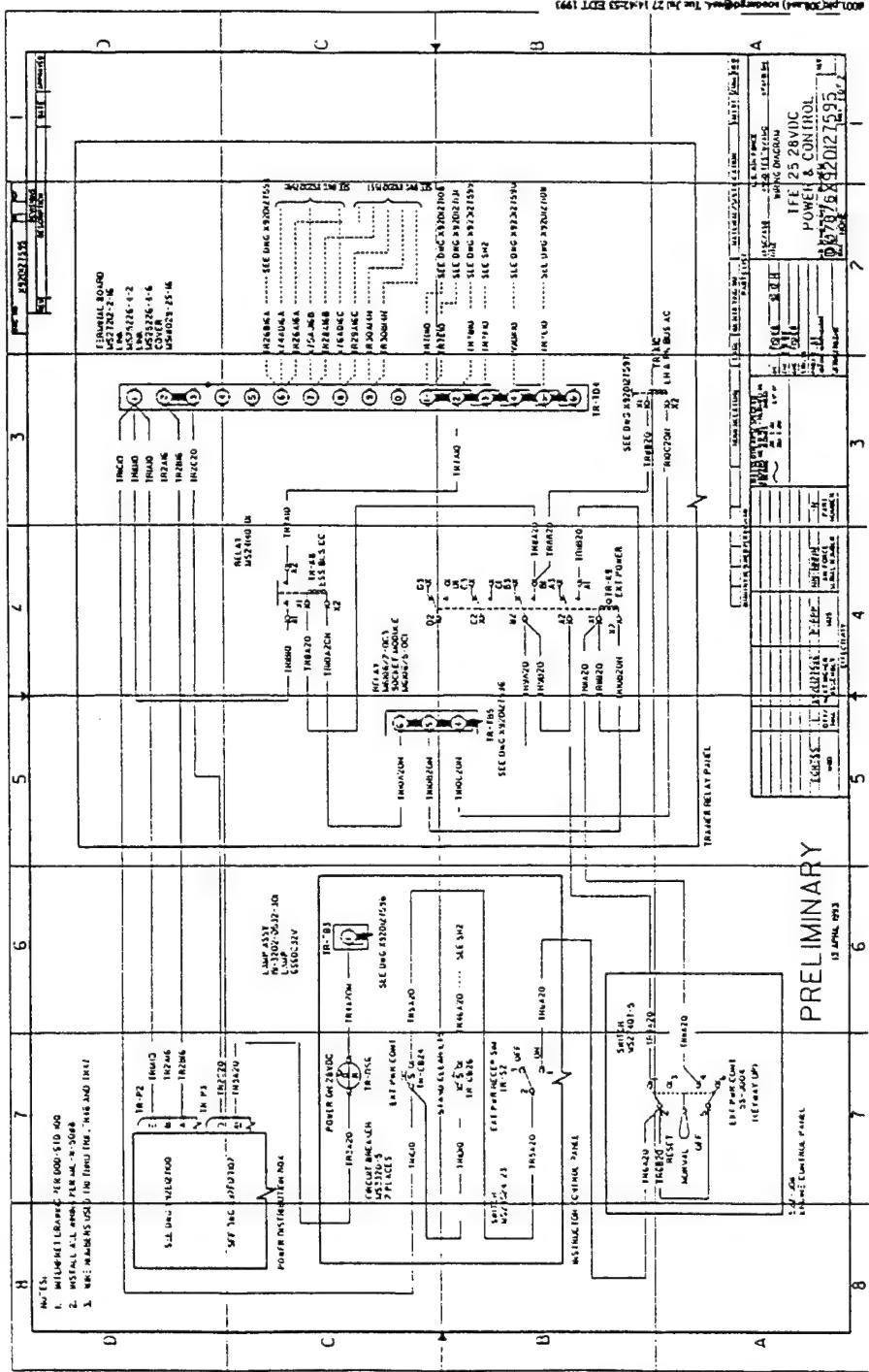
Checking file count...

No errors were encountered during file count verification.  
File Count verification complete.

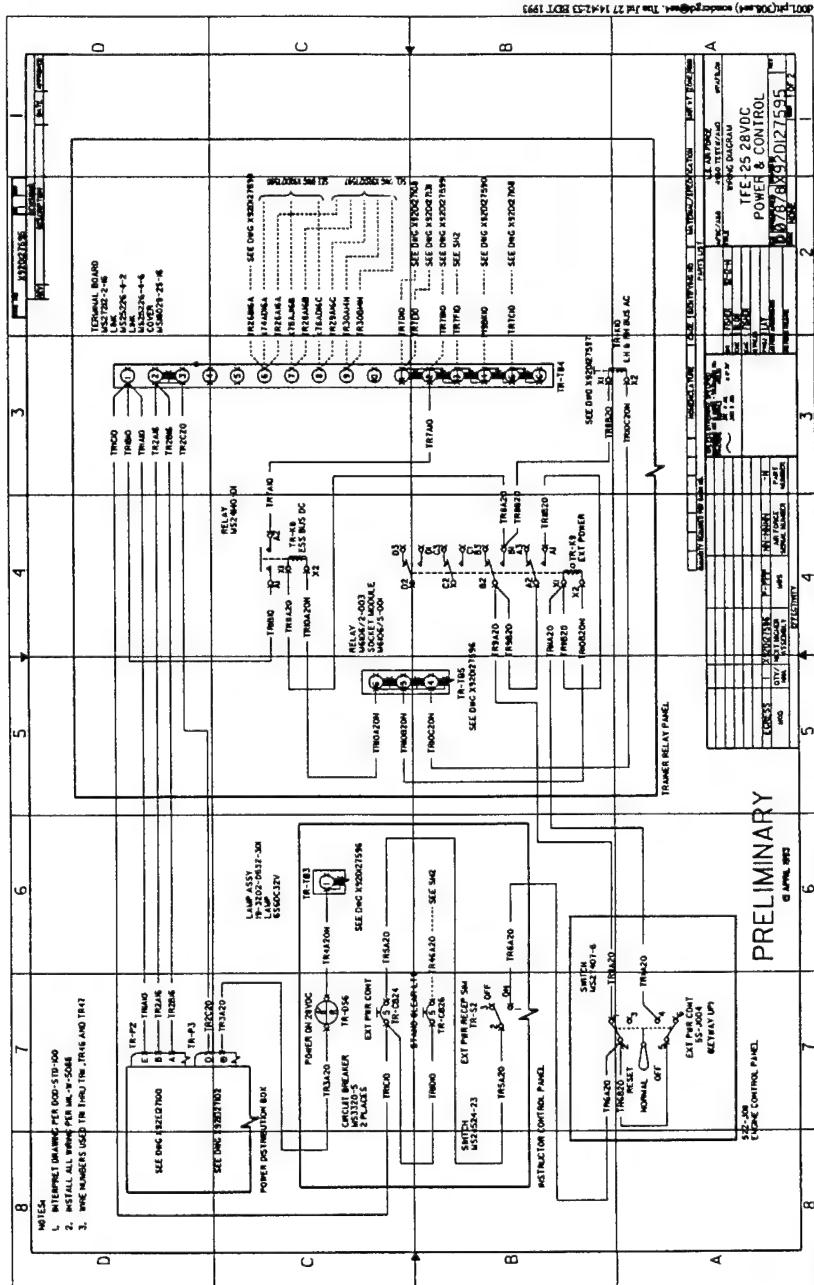
A total of 8 error(s), 0 warning(s), and 7 note(s) were  
encountered in Document D003.

A grand total of 25 error(s), 0 warning(s), and 23 note(s) were  
encountered in this File Set.

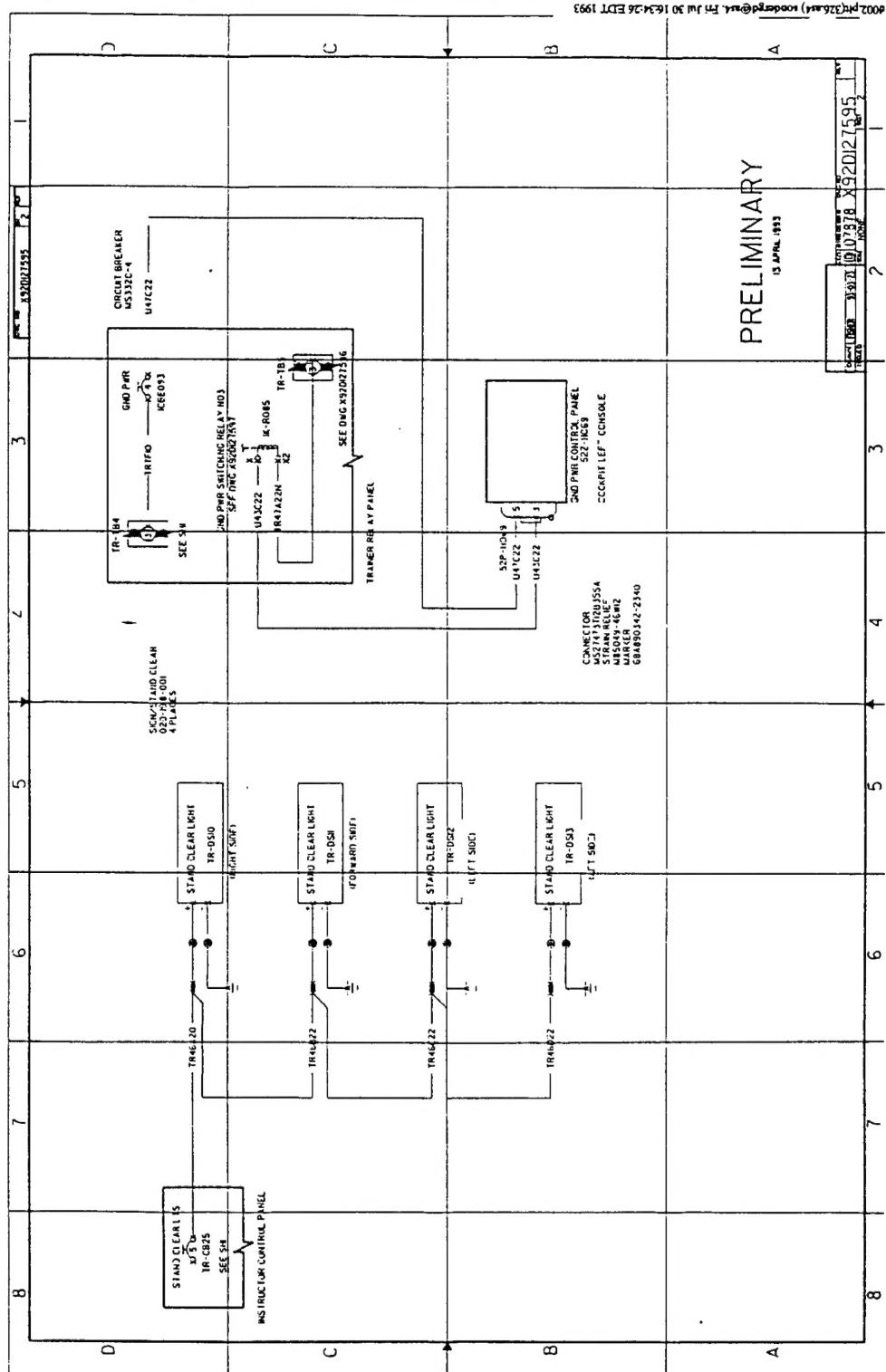
MIL-STD-1840A File Set Evaluation Complete.



## 10. Appendix B - Detailed Raster Analysis

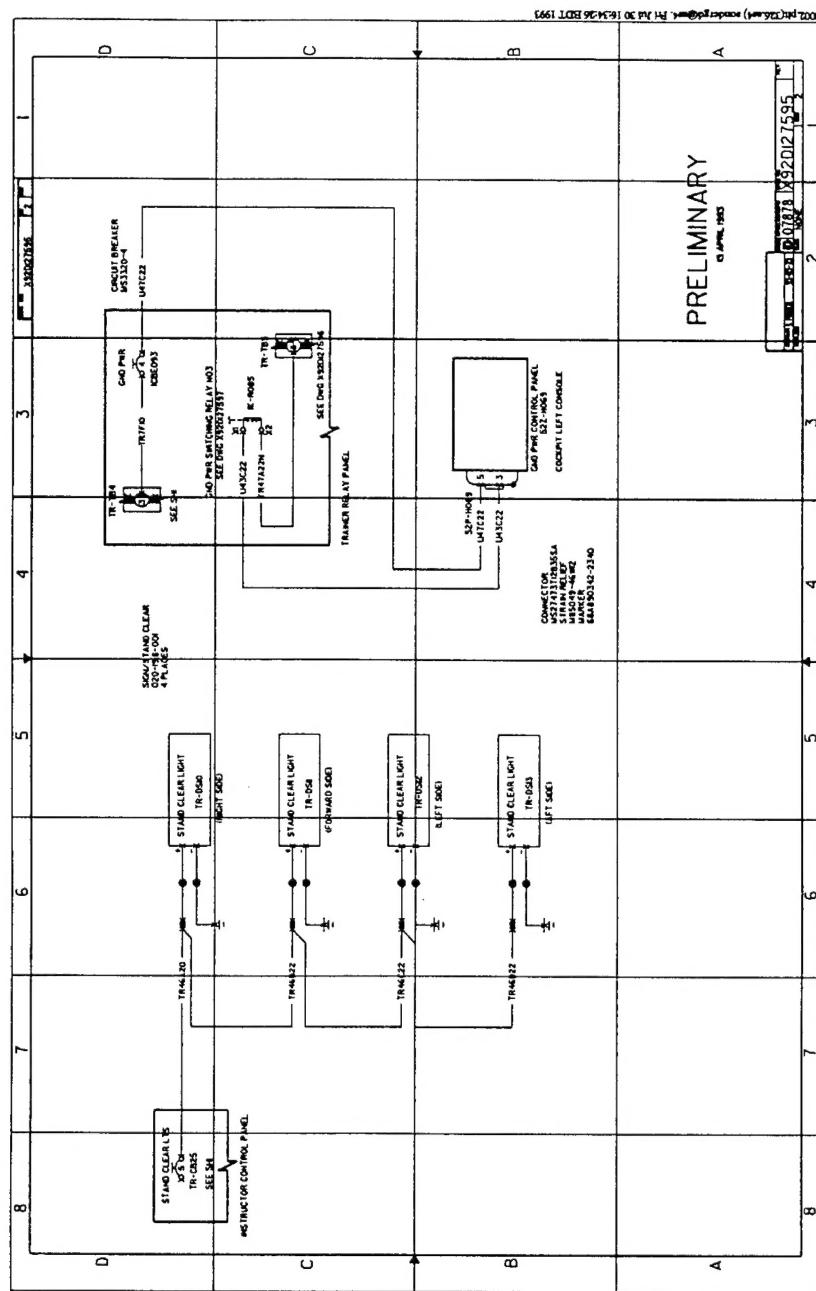


## 10.1.2 Output IGESView

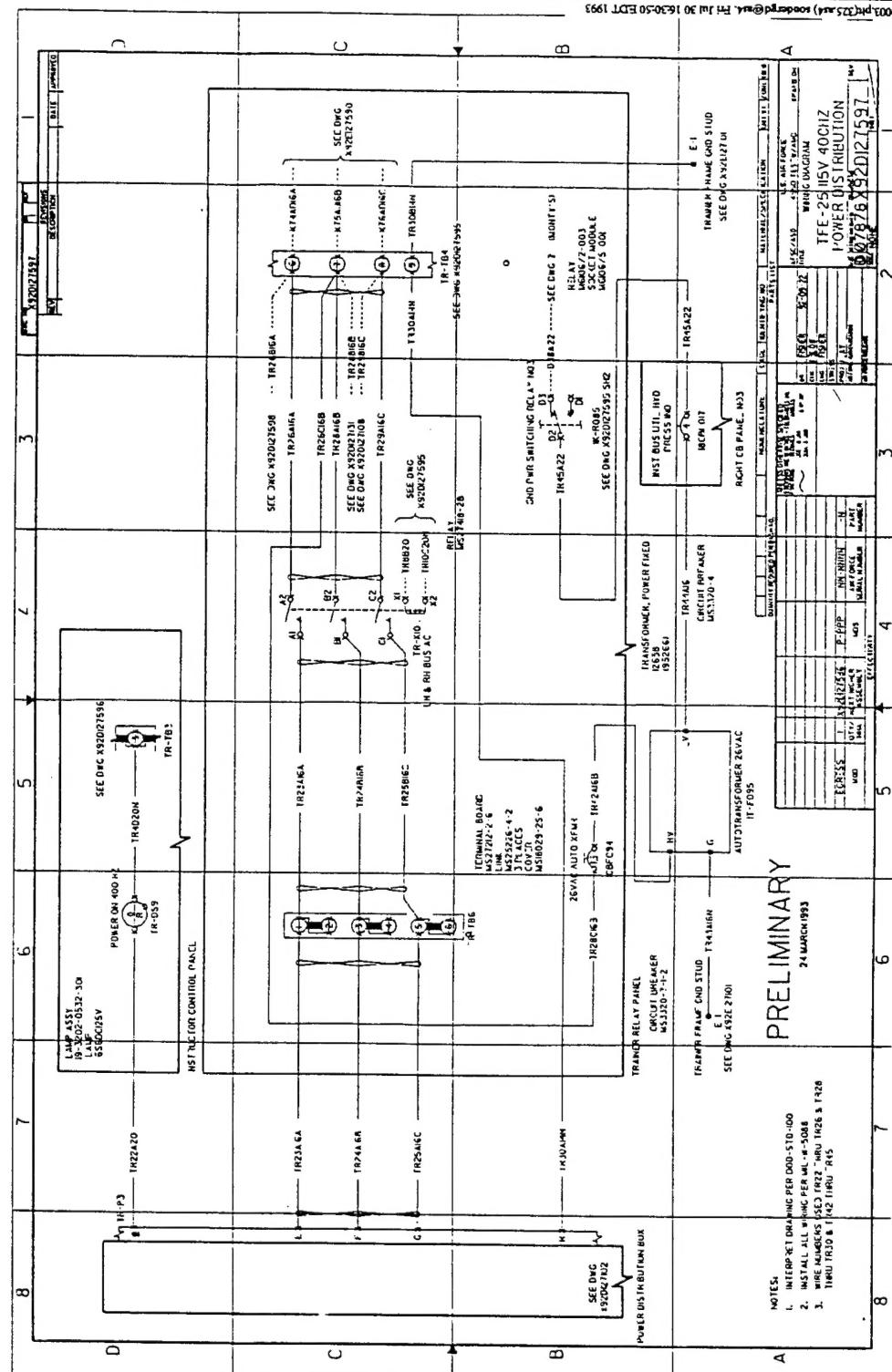


## 10.2.1 Output Preview

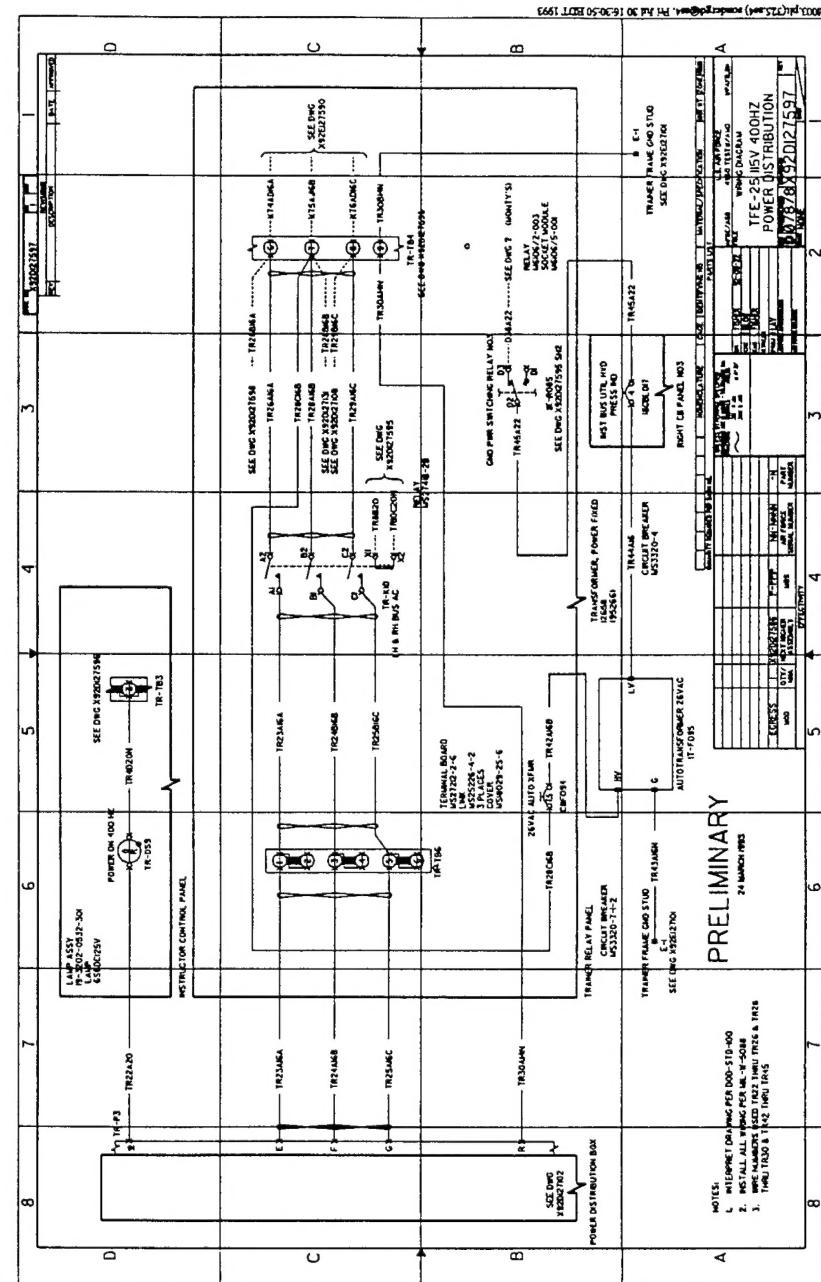
## 10.2 File D002R001



## 10.2.2 Output IGESView



### 10.3.1 Output Preview



### 10.3.2 Output IGESView